

Faisal Shah Khan

📞 (702) 612-2435 @faisal_khan@kenan-flagler.unc.edu 🌐 <https://QuantumSheikh.org> 📍 Apex, North Carolina

SUMMARY

Mathematician with 15+ years of experience in quantum computing, game theory, and interdisciplinary education. Proven ability to translate technical research into actionable insights for academic, corporate, and policy audiences. Skilled in cross-sector collaboration, technical consulting, and science communication.

KEY HIGHLIGHTS & QUALIFICATIONS

Educational Leadership

- Designed and taught undergraduate and graduate courses in mathematics, statistics, engineering, and business with quantum components.
- Supervised multiple student research projects on quantum computing and its applications in finance, imaging, and secure communication.

Outreach & Public Engagement

- Author of *QuantumSheikh.org*, a blog demystifying quantum computing and quantum game theory for diverse audiences.
- Speaker and panelist at public events including UNC Quantum Fall Fest, National Academy of Sciences' Arab-American Symposium, and NC Tech Day.

Grant Writing Experience

- Principal Investigator on grants from Khalifa University and the Swedish Foundation for International Research Cooperation.
- Led projects including a quantum random number generator (Kammiya) and quantum communication for drones and autonomous systems.

Collaboration & Program Development

- Organized experiential learning visits for students, including a quantum lab visit to Duke University.
- Built partnerships across academia, industry, and government to support quantum education and workforce development.

Editorial & Leadership Roles

- Associate Editor for *Quantum Information Processing* journal (2019–2021).
- Organizer for IEEE Quantum Week events and international workshops on quantum technology.

EXPERIENCE

Research Fellow 📅 04/2024 - Present 📍 Chapel Hill, NC
Rethinc. Labs, UNC Kenan-Flagler Business School

- Conducting and supporting research on quantum game theory applications in financial markets, in collaboration with UNC-affiliated researchers.
- Supporting dissemination of findings through academic publications, public engagement, and policy channels.

EDUCATION

PhD. in Mathematical Sciences (Quantum Game Theory)

Portland State University

📅 2009

M.S. in Mathematics

Portland State University

📅 2003

B.S. in Mathematics

Santa Clara University

📅 1997

GRANT WRITING & RESEARCH DEVELOPMENT

Principal Investigator - Khalifa University (2017-2019)

Toward a Quantum Safe Security Infrastructure in the UAE - Secured competitive internal grant to develop a turnkey quantum random number generator-enabled LAN using off-the-shelf components.

Principal Investigator - Khalifa University (2018 - 2021)

Secured grant to develop quantum communication protocols for autonomous systems and drones; led execution and coordinated educational workshops.

Principal Investigator - Swedish Foundation for International Research Cooperation (2014)

Secured international grant to develop quantum game-theoretic models for constrained optimization problems.

CURRENT & EMERGING RESEARCH INTERESTS

Quantum Trading Infrastructure & Alpha Discovery

Developing a quantum-native trading platform in collaboration with UNC researchers and ion-trap quantum specialists, leveraging quantum game-theoretic market models on quantum hardware to identify alpha-generating equilibria.

Quantum Discord in Extensive-Form Quantum Games

Exploring quantum behavioral strategies for extensive-form games with imperfect recall, aiming to demonstrate how quantum discord—without entanglement—can serve as a minimal, physically realizable resource for exceeding classical bounds on rationality.

EXPERIENCE

Adjunct Professor 2021 - Present Raleigh, NC SKEMA Business School USA

- *Aug 2021 – Present / Raleigh, NC*
Teach courses including Business Statistics, Business Intelligence, and AI Consulting.
- Founded and advise the Data Science & Quantum AI student club.
- Designed and led quantum literacy activities for business students.

Senior Project Consultant

 08/2021 - 10/2022  Dubai, UAE

DP World

- Designed and implemented quantum algorithms to optimize container yard operations, enhancing logistical efficiency.
- Facilitated adoption of quantum solutions through outreach to internal stakeholders and technical knowledge transfer across teams.

Assistant Professor

 01/2010 - 06/2020  Abu Dhabi, UAE

Khalifa University

- Taught mathematics and engineering courses to math and engineering students.
- Supervised student research at undergraduate and graduate levels, with emphasis on quantum computing and its applications.
- Arranged academic outreach events and curricula for STEM engagement.
- Committee member for development of undergraduate math degree with tracks in statistics and finance.
- Principal Investigator (2018-2020): Led development of a quantum random number generator platform and promoted quantum adoption through industry and government collaborations.

EDUCATIONAL OUTREACH & PUBLIC ENGAGEMENT

Talks & Presentations

- *Guest Speaker*, Quantum Fall Fest, UNC Chapel Hill –11/2024.
- *Panelist*, Why We Need to Know the Future of Quantum Computing, NC Tech & Lenovo – 05/2024.
- *Presentation on AI & Quantum*, O'Brien Atkins Associates – 01/2024.
- Keynote speaker, Quantum Future Hack, Dubai Economic Dept & Ernst & Young, Dubai, 05/2019.

Student Mentorship & Advising

- *External Mentor*, Senior Design Project on Quantum Hardware, NC State, 08/2024 – 05/2025.
- *Faculty Advisor*, Graduate Thesis on AI in French Education, SKEMA Business School, 06/2023 – Present.
- *Supervisor*, Undergraduate Thesis on Quantum Finance, Khalifa University, 01/ 2018 –12/2018.

Program Development & Events

- *Organizer & Facilitator*, Graduate student visit to Duke University's Quantum Science Center, 04/2024.
- *Organizer*, IEEE Quantum Week Workshops – 2020–2021.

SELECTED PUBLICATIONS

Quantum Advantage in Trading: A Game-Theoretic Approach

Quantum Economics and Finance

with Norbert M. Linke, Anton Than, Dror Baron

 04/2025

 <https://doi.org/10.1177/29767032251333418>

Demonstrates quantum advantage in trading using game-theoretic models on an ion-trap quantum computer, with outcomes that suggest potential for alpha generation.

Calculating Nash Equilibrium on Quantum Annealers

Annals of Operations Research

with Olga Okrut et al.

 01/2024

 <https://doi.org/10.1007/s10479-023-05700-z>

Demonstrates a QUBO formulation of Nash equilibrium solvable on quantum annealers, with observed speedup.

Quantum Information Technology and Innovation: A Brief History, Current State and Future Perspectives for Business and Management

Technology Analysis & Strategic Management

with Davide La Torre

 09/2021

 <https://doi.org/10.1080/09537325.2021.1991576>

Explores the evolution and strategic relevance of quantum information technologies for business innovation and management.

Optimal Control of Traffic Signals Using Quantum Annealing

Quantum Information Processing

with Hashem Hussain et al.

 08/2020

 <https://doi.org/10.1007/s11128-020-02815-1>

Applies QUBO-based optimization to time-dependent traffic signal control on a grid network, demonstrating a hybrid quantum-classical solution using quantum annealing hardware.

Full list of publications available upon request.

SELECTED TALKS

When Recall Fails, Discord Remembers: A Quantum Analogue of Kuhn's Theorem

 05/2025

NC State Quantum Initiative annual symposium.

Quantum Advantage in Trading: A Game-Theoretic Approach

 04/2025

Penn Initiative for the Study of Markets, University of Pennsylvania.

EDUCATIONAL OUTREACH & PUBLIC ENGAGEMENT

Media & Public Recognition

- *Featured Expert*, Phys.org article on North Carolina's quantum leadership, 10/2022.
- *Featured Expert*, Wired Middle East, contributed insights on Abu Dhabi's quantum ecosystem, 08/2022.
- *Profiled*, Very Digital Person, Digitale Welt Magazine (Germany), 05/2021.

LEADERSHIP & AFFILIATIONS

Member

NC Coalition for Global Competitiveness – 2023–Present.

Founder & Principal Investigator

Dark Star Quantum Lab, 2021–2023.

Technology Advisor

Quantum Computing Inc, 2019-2022.

SKILLS

Research Development

Public Speaking

Curriculum Design

Grant Writing

Stakeholder Engagement

Interdisciplinary Collaboration

Education Outreach

Science Communication

Technical Writing

Basic MATLAB

Basic Python

Modeling

Data Analysis

SELECTED TALKS

Is There a World Market for Five Quantum Computers, or Will They Be as Common as Flying Cars?

📅 10/2023

9th Arab-American Frontiers Symposium, United States
National Academy of Sciences, Doha, Qatar.

Quantum Computing: The Apotheosis of Artificial Intelligence

📅 04/2021

Arab AI Summit.

Innovative Pairings: ALTAIR 8800 + Microsoft & Apple I + MOS Technology 6502 Chip - Some Lessons for the Quantum Technology Ecosystem

📅 12/2020

Remote talk sponsored by Washington D.C. Quantum Computing Meetup Group + Cambridge Quantum Computing + Association Quantum.

Full list of presentations and talks available upon request.

REFERENCES

Available Upon Request